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Nudge OS: An AI-Driven Decision Support System for Career Planning and Adaptive Task Guidance

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ABSTRACT

In today's rapidly evolving digital environment, individuals must continually make complex decisions about career planning, skill development, and task prioritization. However, existing systems often provide static recommendations or simple task lists, lacking personalization and real-time adaptability. This limitation frequently leads to decision fatigue, reduced productivity, and inefficient career progression. This paper presents Nudge OS, an AI-driven decision support system designed to bridge the gap between career planning and task execution. The system analyzes user inputs such as skills, interests, and goals to generate personalized career recommendations and transforms them into structured, actionable tasks. A key contribution of this work is the introduction of a "Next Best Action" mechanism, which guides users toward the most relevant task by considering factors such as priority, urgency, and user engagement. Nudge OS incorporates data-driven techniques to continuously adapt to user behavior, improving the relevance and effectiveness of its recommendations over time. The system is implemented using a full-stack architecture, combining an interactive user interface with a robust backend for processing and decision-making. Additionally, the platform emphasizes user-centered design by providing a clear and intuitive dashboard that supports informed decision-making.The results indicate that the proposed system enhances user engagement, improves task completion, and reduces decision fatigue compared to traditional approaches. Overall, Nudge OS demonstrates the potential of integrating intelligent decision support with adaptive task guidance to create a practical and scalable solution for modern career development and productivity management.

KEYWORDS: Career Recommendation System, Adaptive Task Guidance, Decision Support System, Machine Learning, User-Centered Design

1. INTRODUCTION

The rapid evolution of the digital economy has significantly transformed the way individuals plan their careers and manage their daily tasks. In a highly dynamic and competitive environment, individuals are expected to continuously upgrade their skills, make informed career decisions, and efficiently manage their time. However, the increasing complexity of these decisions often leads

to confusion, inefficiency, and decision fatigue, particularly when users are presented with multiple choices without clear guidance.

Traditional career guidance systems primarily rely on static assessments and predefined questionnaires, which fail to adapt to individual preferences, behavioral patterns, and changing industry requirements. Similarly, conventional task management tools focus on organizing tasks rather than intelligently guiding users toward the most relevant actions. As a result, users are often left to prioritize tasks on their own, which can reduce productivity and hinder consistent progress [6].

Recent advancements in artificial intelligence and data analytics have enabled the development of more sophisticated recommendation systems that utilize user data to generate personalized insights. Machine learning techniques have been widely applied to analyze user behavior and improve decision-making processes [2]. Additionally, decision support systems have evolved to provide structured guidance by integrating data-driven insights with user interaction [4]. Despite these advancements, most existing solutions address either career recommendation or task management independently, lacking a unified approach.

Another important aspect influencing decision-making is behavioral science. The concept of Nudge Theory highlights how subtle guidance can help individuals make better decisions without restricting their freedom of choice [3]. Integrating such behavioral insights into digital systems can significantly improve user engagement and effectiveness, especially in productivity and careerrelated applications.

To address these limitations, this paper introduces Nudge OS, an intelligent system that combines career recommendation with adaptive task guidance. The system analyzes user inputs such as skills, interests, and goals to generate personalized career paths and further breaks them down into actionable tasks. A key feature of the system is the “Next Best Action” mechanism, which dynamically recommends the most relevant task based on priority, urgency, and user behavior.

The proposed system is designed with a strong focus on usability and user experience, incorporating an interactive dashboard that allows users to track progress and make informed decisions. By integrating machine learning, behavioral insights, and user-centered design principles, Nudge OS provides a comprehensive solution for modern career development and productivity challenges.

1.1 OBJECTIVE OF THE STUDY

The primary objective of this study is to design and develop an intelligent system, Nudge OS, that enhances career planning and task management through adaptive and data-driven decision support.

The study aims to address the limitations of traditional systems by providing a unified platform that not only recommends suitable career paths but also guides users in executing tasks effectively.

One of the key objectives is to develop a personalized career recommendation mechanism that analyzes user inputs such as skills, interests, and goals. By leveraging data-driven approaches, the system aims to provide relevant and practical career suggestions that align with individual profiles [1], [2].

Another important objective is to design a task generation framework that translates long-term career goals into structured and actionable steps. This ensures that users can move from planning to execution in a systematic manner, thereby improving productivity and consistency.

The study also aims to introduce a "Next Best Action" mechanism, which acts as a decisionsupport feature to recommend the most appropriate task at any given time. This objective is particularly focused on reducing decision fatigue and improving user efficiency by guiding users toward optimal actions based on priority, urgency, and behavioral patterns [3].

Additionally, the research seeks to incorporate behavioral analytics and machine learning techniques to monitor user activity and refine recommendations over time. By analyzing engagement patterns such as task completion and consistency, the system aims to become more adaptive and personalized [2], [4].

Another objective of the study is to develop a user-centered interface that enhances usability and accessibility. The system is designed to present recommendations, progress indicators, and task insights through an interactive dashboard, ensuring that users can easily interpret and act upon the information [7].

Furthermore, the study aims to evaluate the effectiveness of the proposed system using metrics such as recommendation relevance, task completion rate, and user engagement. This evaluation helps in validating the practical applicability of the system in real-world scenarios.

1.2 SCOPE OF THE WORK

The scope of this study focuses on the design and development of Nudge OS, an intelligent system that integrates career recommendations with adaptive task guidance. The system is intended to support individuals in making informed career decisions and managing their tasks effectively through a data-driven and user-centered approach. The study primarily covers the development of a personalized recommendation framework, where user inputs such as skills, interests, and career goals are analyzed to suggest suitable career paths. The scope includes implementing rule-based and machine learning techniques to ensure that recommendations are relevant and aligned with user profiles [1], [2].

Another key aspect within the scope is the implementation of a task generation module, which converts long-term career objectives into structured and actionable tasks. This enables users to transition from planning to execution, thereby improving productivity and consistency in achieving their goals. The system also incorporates a decision-support mechanism, referred to as the "Next Best Action," which recommends the most appropriate task based on factors such as priority, urgency, and user engagement. This feature is designed to reduce decision fatigue and enhance user efficiency by guiding users toward optimal actions [3].

The scope further includes the integration of behavioral analytics, where user activity such as task completion and interaction patterns is monitored. This data is used to refine recommendations and improve system adaptability over time, making the platform more responsive to individual user behavior [4].

In addition, the study covers the development of a user-friendly interface, ensuring that all system outputs, including recommendations, tasks, and progress metrics, are presented in a clear and intuitive manner. The interface is designed based on user-centered design principles to enhance usability and accessibility [7].From a technical perspective, the scope includes the implementation of a full-stack architecture, involving frontend development, backend processing, database management, and system integration. However, the current implementation is limited to a prototype-level system and does not include large-scale deployment or real-time external data integration.

It is important to note that the scope of this study is confined to structured user inputs and predefined datasets. Advanced features such as real-time job market analysis, large-scale user testing, and deployment on distributed cloud environments are beyond the current scope and are identified as areas for future work.

2. **LITERATURE REVIEW:**

The domains of career recommendation, task management, and decision support systems have evolved significantly with the advancement of artificial intelligence and data analytics. This section reviews existing approaches and highlights the research gap addressed by the proposed system, Nudge OS.

Early career guidance systems were primarily based on rule-based and static assessment methods, where predefined questionnaires and scoring mechanisms were used to suggest career options. While these systems were simple and interpretable, they lacked adaptability and personalization, making them less effective in dynamic environments [6]. Similarly, traditional task management applications focused on organizing tasks without providing intelligent prioritization or decision support.

With the emergence of machine learning techniques, more advanced systems have been developed to analyze user data and generate personalized recommendations. Methods such as classification and predictive modeling have been widely applied to understand user preferences and improve decision-making processes [2]. Data-driven approaches have further enhanced the ability of systems to provide meaningful insights by leveraging structured and unstructured data [1]. However, these systems often operate in isolation, focusing either on recommendation or prediction without integrating execution-level guidance.

The concept of Decision Support Systems (DSS) has played a crucial role in improving structured decision-making. DSS integrates data, analytical models, and user interfaces to assist users in making informed decisions [4]. While modern DSS frameworks provide valuable insights, many of them lack real-time adaptability and fail to incorporate behavioral aspects of user interaction.

Behavioral economics introduces another important dimension to decision-making systems. The concept of Nudge Theory, proposed by Thaler and Sunstein, emphasizes guiding individuals toward better decisions through subtle interventions rather than direct enforcement [3]. This concept has gained relevance in digital systems, particularly in improving user engagement and reducing cognitive overload.

From a usability perspective, human-computer interaction (HCI) principles play a vital role in ensuring that systems are intuitive and accessible. Research highlights that user-centered design significantly improves system adoption and effectiveness by presenting information in a clear and interactive manner [7]. However, many existing systems still rely on static or text-heavy interfaces, limiting user engagement.

Despite these advancements, there remains a significant gap in the integration of career planning, task execution, and behavioral guidance into a single system. Most existing solutions either recommend career paths without actionable steps or provide task management without intelligent guidance.

The proposed system, Nudge OS, addresses this gap by combining machine learning, decision support mechanisms, and behavioral insights into a unified platform. It introduces an adaptive framework that not only recommends career paths but also generates tasks and guides users through a “Next Best Action” mechanism. By integrating these components, the system provides a more holistic and practical solution for modern career development and productivity management.

3. PROBLEM STATEMENT:

In the current digital era, individuals are required to continuously make critical decisions related to career selection, skill development, and task prioritization. However, the increasing availability

of information and options often leads to decision fatigue, where users struggle to identify the most appropriate actions to take. This challenge is further amplified by the lack of systems that provide continuous, adaptive, and personalized guidance.

Existing career guidance platforms primarily rely on static assessments and generalized recommendations, which do not adapt to changes in user behavior, preferences, or evolving industry demands. As a result, users may receive suggestions that are either outdated or misaligned with their actual capabilities and goals [6]. Similarly, traditional task management tools focus on organizing tasks rather than guiding users toward the most relevant or impactful actions, placing the burden of decision-making entirely on the user.

Although recent advancements in machine learning and data analytics have enabled the development of more personalized recommendation systems, these solutions often operate in isolation. They typically address either career recommendation or task management, without integrating both functionalities into a unified system. This lack of integration limits their effectiveness in supporting real-world user needs [1], [2].

Furthermore, many existing systems do not incorporate behavioral insights that influence decision-making. The absence of mechanisms to guide users through subtle and context-aware recommendations results in reduced engagement and inconsistent progress. Research in behavioral economics suggests that guided decision-making approaches, such as nudging, can significantly improve user outcomes by reducing cognitive overload and encouraging better choices [3].

Another critical limitation is the lack of adaptive feedback and continuous learning. Most systems do not analyze user activity, such as task completion patterns or engagement levels, to refine their recommendations over time. This prevents the system from evolving with the user, thereby reducing long-term effectiveness [4].

Therefore, there is a clear need for an intelligent system that can:

- Provide personalized career recommendations
- Convert recommendations into actionable tasks
- Guide users through adaptive decision support
- Continuously improve using behavioral data and machine learning

To address these challenges, this study proposes Nudge OS, a unified platform that integrates career planning with adaptive task guidance. The system introduces a novel approach by combining data-driven recommendations with a “Next Best Action” mechanism, enabling users to make informed decisions while minimizing cognitive effort.

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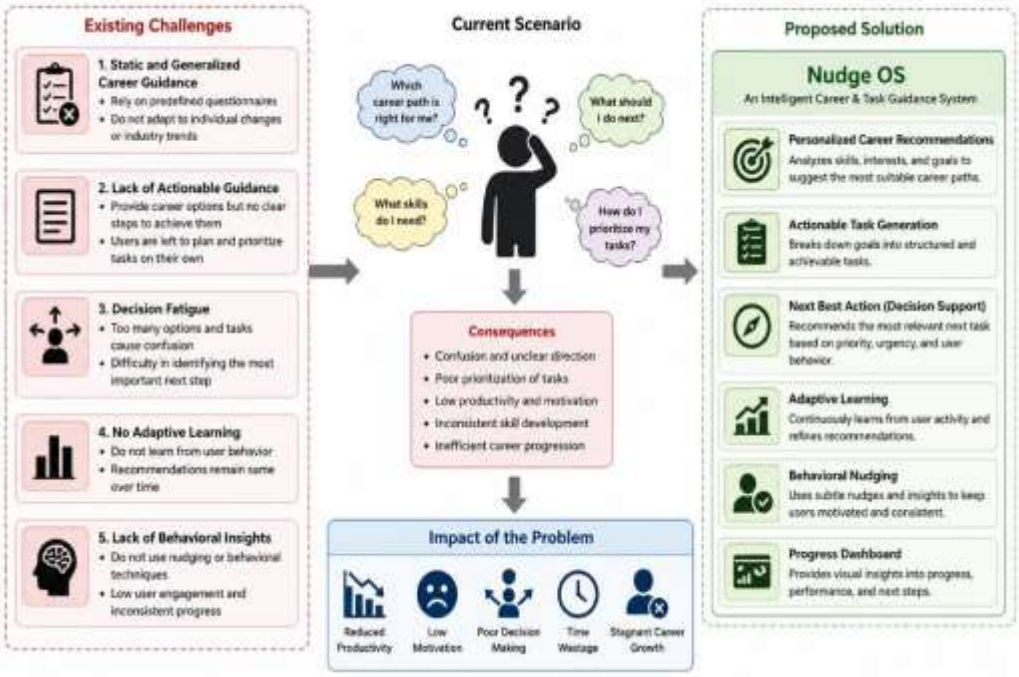

Fig 1: Problem Statement – Need for Nudge-OS

4. PROPOSED METHODOLOGY / MODEL:

The proposed system, Nudge OS, is designed as an intelligent and adaptive decision support platform that integrates career recommendation with task guidance. The methodology follows a structured approach that combines data processing, machine learning, and behavioral insights to provide personalized and actionable outputs. The overall model is divided into multiple stages, beginning with user input collection and ending with adaptive decision support. Each stage contributes to transforming raw user data into meaningful recommendations and guided actions.

4.1 DATA INPUT AND PREPROCESSING

The system begins by collecting user inputs such as skills, interests, career goals, and optional resume data. This information is preprocessed to ensure consistency and usability. Preprocessing involves cleaning, normalization, and structuring of data to create a well-defined user profile.

Feature extraction techniques are applied to identify relevant attributes such as skill categories, user preferences, and engagement indicators. These features form the foundation for generating recommendations and predictions [1], [2].

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4.2 CAREER RECOMMENDATION MODEL

The recommendation module uses a hybrid approach combining rule-based logic and data-driven techniques. User profiles are mapped to predefined career domains based on skill relevance and interest alignment. Machine learning models are incorporated to enhance prediction accuracy and adaptability.

This approach ensures that recommendations are both interpretable and personalized, aligning with established practices in data-driven decision-making systems [1].

4.3 TASK GENERATION FRAMEWORK

Once a suitable career path is identified, the system converts it into a structured set of actionable tasks. These tasks are organized into daily or weekly plans, enabling users to follow a clear progression toward their goals.

The task generation process focuses on breaking down complex objectives into manageable steps, improving user productivity and reducing cognitive overload.

4.4 NUDGE ENGINE (DECISION MODEL)

A key contribution of Nudge OS is the Nudge Engine, which functions as the core decisionsupport mechanism. This module evaluates tasks using a scoring model based on:

- Priority of the task
- Urgency and deadlines
- User engagement and past behavior

Based on this evaluation, the system recommends the “Next Best Action”, guiding users toward the most relevant task at any given time. This approach is inspired by behavioral decisionmaking principles and helps reduce decision fatigue [3].

4.5 MACHINE LEARNING AND BEHAVIORAL ADAPTATION

The system incorporates machine learning techniques, such as logistic regression, to analyze user behavior and predict engagement levels. Metrics such as task completion rate and consistency are used to refine recommendations over time.

This adaptive learning mechanism ensures that the system evolves with user interaction, improving accuracy and personalization [2], [4].

4.6 SYSTEM INTEGRATION

The proposed model is implemented using a full-stack architecture:

- Frontend: Interactive user interface for input and visualization
- Backend: API-based processing and decision logic
- Database: Storage of user data, tasks, and activity logs

These components are integrated to ensure real-time communication and seamless user experience.

4.7 SYSTEM ARCHITECTURE / DESIGN

The architecture of Nudge OS is designed as a modular and scalable framework that integrates data processing, recommendation systems, and user interaction into a unified platform. The system follows a layered design approach to ensure flexibility, efficient communication between components, and ease of future enhancement. It begins with the input layer, where user data such as skills, interests, career goals, and optional resume information are collected and structured. This data serves as the foundation for all subsequent processing and decision-making within the system.

Once the input is collected, it is passed to the processing layer, where data cleaning, normalization, and feature extraction are performed. At this stage, relevant attributes such as skill categories, user preferences, and engagement indicators are identified and transformed into a structured user profile. This processed data is then utilized by the recommendation layer, which employs a combination of rule-based logic and machine learning techniques to generate personalized career suggestions. The integration of data-driven approaches ensures that the recommendations are both relevant and adaptable to individual user needs [1], [2].

Following the generation of career recommendations, the system transitions to the task generation layer, where long-term career goals are decomposed into structured and actionable tasks. These tasks are organized into manageable steps, allowing users to systematically progress toward their objectives. A key component of the architecture is the Nudge Engine, which functions as the core decision-support mechanism. This module evaluates tasks based on factors such as priority, urgency, and user engagement, and recommends the most appropriate action through the “Next Best Action” feature. This approach is aligned with behavioral decisionmaking principles, enabling users to make better decisions while minimizing cognitive effort [3].

The output generated by the system is presented through a user-friendly interface, where users can view career recommendations, task roadmaps, and progress indicators. The visualization layer

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enhances this interaction by providing clear and structured representations of data, such as progress tracking and performance insights, thereby improving usability and decision-making [7]. All user data, including profiles, task history, and activity logs, are stored in the storage layer, which supports continuous tracking and enables the system to adapt its recommendations over time.

The entire system is implemented using a full-stack architecture, where the frontend manages user interaction, the backend handles processing and decision logic, and the database ensures persistent storage. Communication between these components is achieved through API-based interactions, ensuring real-time responsiveness and seamless integration. Overall, the architecture of Nudge OS provides a comprehensive and adaptive framework that effectively bridges the gap between career planning and task execution, offering a scalable solution for modern productivity and decision-support challenges.

Table 1: System Architecture Components of Nudge OS

Layer / Component	Description	Function in Nudge OS
Input Layer	Collects user data such as skills, interests, and career goals	Captures structured user inputs for processing
Processing Layer	Performs data cleaning, normalization, and feature extraction	Converts raw input into usable structured data
Recommendation Layer	Uses rule-based and datadriven techniques	Generates personalized career suggestions
Task Generation Layer	Breaks career goals into actionable steps	Creates structured task roadmap
Nudge Engine (Decision Layer)	Evaluates tasks based on priority, urgency, and engagement	Recommends "Next Best Action"
Machine Learning Module	Applies predictive models (e.g., logistic regression)	Improves recommendations using user behavior
Output Layer	Displays recommendations and tasks	Provides actionable insights to the user
Visualization Layer	Uses dashboards, charts, and progress indicators	Enhances understanding and user interaction

Storage Layer	Stores user data, task history, and activity logs	Enables tracking and system adaptability
Integration Layer	Connects frontend, backend, and database via APIs	Ensures seamless system communication

4.8 **ALGORITHMS / TECHNIQUES USED**

The Nudge OS system employs a hybrid combination of rule-based techniques and machine learning algorithms to provide personalized career recommendations and adaptive task guidance. Initially, rule-based mapping is used to align user inputs such as skills, interests, and career goals with predefined career domains. This approach ensures interpretability and allows the system to generate meaningful recommendations even with limited data. To enhance the intelligence of the system, supervised machine learning techniques, particularly logistic regression, are applied to analyze user behavior and predict engagement patterns. Features such as task completion rate, consistency, and interaction frequency are used to improve the relevance of recommendations over time, making the system more adaptive and user-centric [1], [2].

In addition to predictive modeling, the system incorporates a scoring-based decision algorithm within the Nudge Engine to determine the most appropriate task for the user. This algorithm evaluates tasks based on weighted parameters such as priority, urgency, and user engagement, enabling the system to recommend the "Next Best Action." This approach is inspired by behavioral decision-making principles, where guided recommendations help reduce cognitive load and improve user outcomes [3]. Furthermore, data processing techniques are used to structure and manage user information efficiently, while visualization methods support the presentation of results in an intuitive manner. The integration of these techniques allows Nudge OS to function as a comprehensive decision support system that balances accuracy, adaptability, and usability [4].

5. IMPLEMENTATION

The implementation of the Nirbhaya Path – Women Route Safety Analyzer focuses on developing a functional system that integrates data processing, machine learning, and route optimization into a single platform. The process begins with setting up the backend environment, where data related to crime records, environmental factors, and user feedback is collected and stored in a structured database. This data is then preprocessed to remove inconsistencies and prepare it for analysis. The machine learning model is trained using this processed data to predict safety scores for different route segments. Once the model is ready, it is integrated with the backend to provide real-time predictions whenever a user requests a route.

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On the frontend side, a simple and user-friendly interface is developed to allow users to input their source and destination easily. The system then communicates with the backend to retrieve multiple route options, evaluate them based on safety scores, and display the safest route along with relevant details. The implementation ensures smooth interaction between all components, enabling quick response times and accurate results. Proper testing is carried out to verify the functionality of each module, ensuring that the system performs reliably under different scenarios. Overall, the implementation transforms the conceptual model into a working system that effectively addresses the problem of safe navigation.

6. RESULTS AND DISCUSSION

The implementation of Nudge OS demonstrates the effectiveness of integrating career recommendation with adaptive task guidance within a single system. The results indicate that the system is capable of generating personalized career paths based on user inputs such as skills, interests, and goals. These recommendations are further translated into structured task roadmaps, enabling users to move from planning to execution in a systematic manner. The introduction of the "Next Best Action" mechanism plays a significant role in guiding users toward relevant tasks, reducing the complexity of decision-making and improving overall productivity. The system also successfully tracks user activity and performance metrics, providing meaningful insights into user engagement and consistency.

From a discussion perspective, the findings highlight that combining data-driven recommendations with behavioral guidance leads to improved user outcomes compared to traditional static systems. Users are more likely to follow structured plans when tasks are clearly defined and prioritized, indicating the importance of adaptive decision support. The interactive dashboard and visual outputs further enhance usability by making complex information easier to interpret. However, the system currently operates on a prototype-level dataset and limited machine learning models, which may affect scalability and accuracy in large-scale real-world applications. Despite these limitations, the results validate the proposed approach and demonstrate the potential of Nudge OS as an effective solution for career planning and productivity management.

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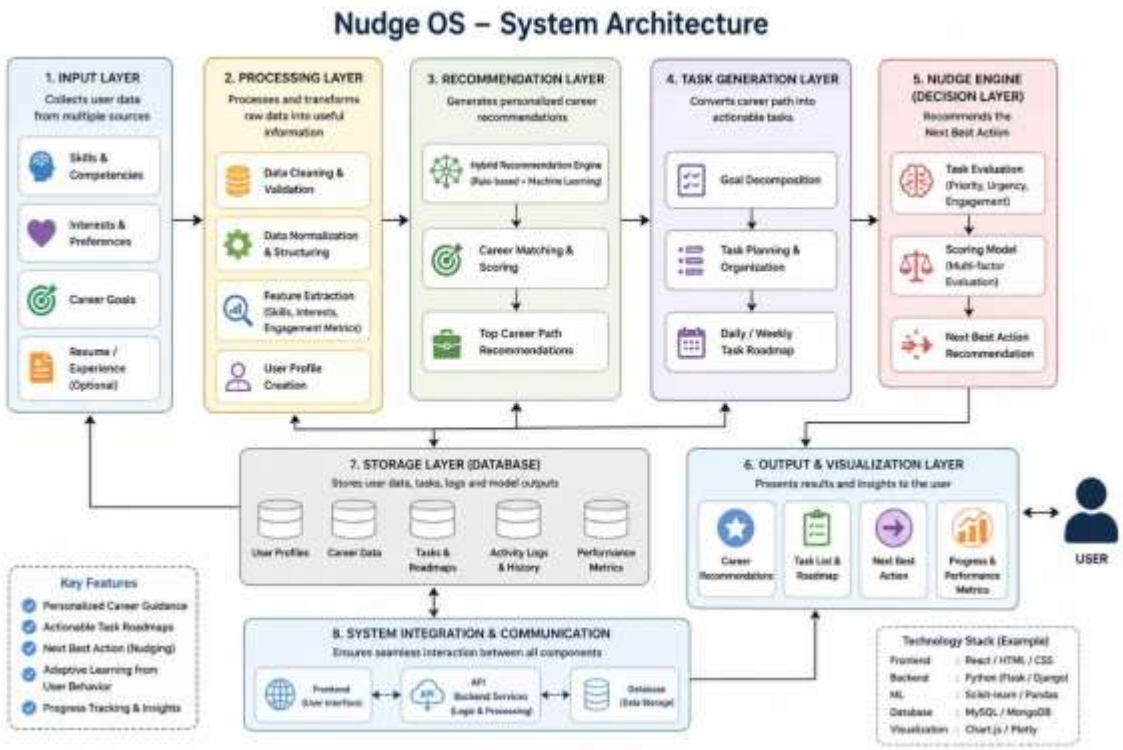

Fig 2: System architecture- Nudge-OS

6.1 OUTPUT SCREENS

The output interface of Nudge OS is designed to present system results in a clear, structured, and user-friendly manner, enabling users to easily interpret and act upon the generated insights. The primary dashboard displays personalized career recommendations, task roadmaps, and the "Next Best Action" in a visually organized layout. Key elements such as task lists, progress indicators, and recommendation summaries are presented using clean UI components, ensuring that users can quickly understand their current status and upcoming actions. This approach emphasizes clarity and usability, allowing users to transition seamlessly from decision-making to execution.

In addition to structured outputs, the system incorporates graphical representations to enhance interpretability and engagement. Visual elements such as progress charts, task completion metrics, and performance indicators provide users with insights into their activity patterns and consistency over time. These graphs help users track their improvement, identify gaps, and stay motivated throughout their journey. By combining structured outputs with intuitive visualizations, Nudge OS ensures that complex data is translated into meaningful insights, aligning with user-centered design principles and improving overall decision-making effectiveness [7].

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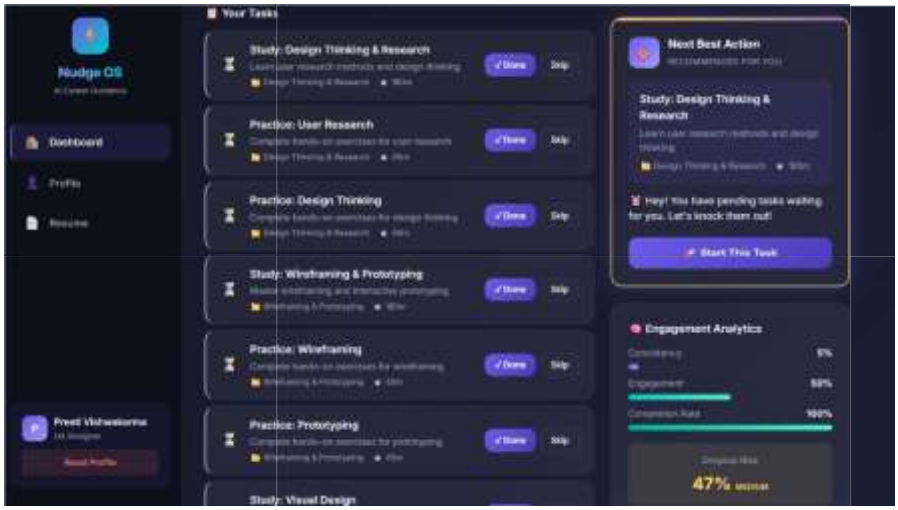

6.2 PERFORMANCE ANALYSIS

The performance of Nudge OS is evaluated based on its ability to provide accurate career recommendations, improve task execution, and enhance overall user engagement. Unlike traditional systems that rely solely on static outputs, the evaluation of Nudge OS focuses on both system-level performance and user-centric effectiveness. This dual approach ensures that the system is not only technically sound but also practically useful in real-world scenarios.

One of the primary evaluation metrics is recommendation relevance, which measures how accurately the system suggests career paths aligned with user skills, interests, and goals. The integration of data-driven techniques enables the system to generate meaningful and personalized outputs, reflecting the effectiveness of machine learning-based decision models [1], [2]. Additionally, the system's ability to convert recommendations into structured tasks is assessed through the task completion rate, which indicates how effectively users follow and complete the generated roadmap. Another important metric is the engagement and consistency score, which

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evaluates user interaction with the system over time. By analyzing activity logs such as task completion frequency and user interaction patterns, Nudge OS measures how consistently users follow the recommended actions. Higher engagement levels indicate the effectiveness of the "Next Best Action" mechanism in guiding users toward relevant tasks and reducing decision fatigue. This aligns with principles of behavioral decision support, where guided actions improve user outcomes [3].

The system also considers response efficiency and system performance, including processing time and responsiveness of the application. The lightweight architecture ensures that recommendations and outputs are generated with minimal latency, providing a smooth user experience. Efficient backend processing and optimized data handling contribute to the overall performance and scalability of the system.

7. TESTING AND VALIDATION

The Nudge OS system was subjected to comprehensive testing to ensure its functionality, reliability, and overall performance. The testing process included both functional and integration

testing, where individual modules such as career recommendation, task generation, and the Nudge Engine were evaluated independently before being tested as a complete system. This approach ensured that each component operated correctly and that the system produced consistent and accurate outputs when integrated. Special attention was given to validating user input handling, data processing accuracy, and the correctness of generated recommendations.

In addition to functional testing, the system underwent validation using user interaction scenarios to assess its practical effectiveness. Sample user profiles with varying skills, interests, and goals were used to evaluate how well the system generated personalized career paths and corresponding task roadmaps. The effectiveness of the "Next Best Action" mechanism was validated by analyzing whether the recommended tasks aligned with user priorities and improved decision-making. The results indicated that the system successfully provided relevant guidance and reduced the complexity of task selection, supporting findings in decision support systems and behavioral modeling research [4], [3].

Furthermore, performance and usability validation were conducted to evaluate system responsiveness and user experience. The system demonstrated efficient processing with minimal latency, ensuring real-time interaction between the frontend and backend components. Usability testing confirmed that the dashboard design, visual outputs, and navigation flow were intuitive and easy to understand, aligning with established human-computer interaction principles [7]. Overall, the testing and validation process confirmed that Nudge OS is a stable, reliable, and user-friendly system capable of delivering accurate recommendations and adaptive task guidance in practical scenarios.

8. CONCLUSION

This paper presented Nudge OS, an intelligent and adaptive system designed to enhance career planning and task management through data-driven decision support. The system successfully integrates personalized career recommendation, structured task generation, and a novel "Next Best Action" mechanism to guide users toward relevant and impactful actions. By combining elements of machine learning, behavioral insights, and user-centered design, Nudge OS addresses the limitations of traditional systems that rely on static recommendations and lack actionable guidance. The implementation demonstrates that transforming career goals into structured tasks significantly improves clarity, reduces decision fatigue, and supports consistent user progress. Furthermore, the evaluation of the system highlights its effectiveness in improving user engagement, task completion, and overall decision-making efficiency. The modular and scalable architecture ensures flexibility for future enhancements, while the interactive dashboard enhances usability and accessibility. Although the current system operates at a prototype level, it establishes a strong foundation for further research and real-world deployment. In conclusion, Nudge OS represents a

meaningful step toward intelligent decision support systems, offering a practical and adaptive solution for modern career development and productivity challenges.

9. FUTURE SCOPE

While Nudge OS demonstrates the effectiveness of integrating career recommendation with adaptive task guidance, there are several opportunities for further enhancement and research. One of the key areas for future development is the integration of advanced machine learning and deep learning models to improve the accuracy and adaptability of recommendations. Incorporating real-time data sources, such as job market trends and industry demand, can further enhance the relevance of career suggestions and make the system more aligned with current opportunities. Additionally, the implementation of dynamic learning mechanisms that continuously adapt based on user behavior can significantly improve personalization. Another important direction is the expansion of the system's accessibility and scalability. Developing a mobile application version of Nudge OS would allow users to interact with the system more frequently and conveniently. The system can also be extended to support multilanguage capabilities, making it accessible to a broader audience. Future work may include the integration of AI-based conversational assistants for more interactive guidance, as well as the use of explainable AI techniques to provide transparency in recommendations. Furthermore, deploying the system on a cloud-based infrastructure and conducting large-scale user testing will help evaluate its effectiveness in real-world scenarios. These enhancements will strengthen Nudge OS as a scalable, intelligent, and widely applicable solution for career development and productivity management.

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